THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
MARINE RESOURCES OPERATIONS

REPORT FOR THE MONTH OF MARCH 1968

J. B. Phillips, world renowned fisheries specialist for rockfishes, retired after 40 years with the State.

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The abalone season opened March 16 and Morro Bay divers averaged nine dozen per day. Sea otters were sighted in the Point Estero-Cambria area at a point two miles further south than last year.

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The oyster seed importation this year from Japan was 10,355 cases, the largest amount brought in since 1964 when 10,625 cases came across the Pacific.

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Crab fishing off northern California resulted in landings exceeding the 10.3 million pounds of last year. We expect a record high for this season. San Francisco landings, while double last year's, are only half the predicted catch.

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The ALASKA found evidence of heavy anchovy spawning off central California.

"HEAD STONE" COLLECTING IN CENTRAL AMERICA - MARCH 1968

The National Science Foundation grant financing John Fitch's Miocene otolith study provided an opportunity to visit Central America between March 5 and 24, 1968. Miocene was a warm, tropical period in the United States, thus, a trip south was planned to obtain a comparative otolith collection from living fishes in the tropical climate.

Panama City, Republic of Panama, was the first port of call. Contacts were made there with people from FAO, the Smithsonian Institute and the Panamanian Departamento de Pesca e Industrias Conexas. Several people wished to send regards to acquaintances in California. To mention a few: Drs. Bill Bayliff (FAO) and Ira Rubinoff (STRI); Bob Topp and Peter Glynn (STRI); and Sr. Juan de Obarrio (DPIC). Small collections of otoliths were obtained from fish (mostly sciaenids) purchased in the Panama market and some estuarine fishes donated to the cause by the Smithsonian personnel.

Next temporary headquarters was established in western Panama at the city of David. Dick Croker's brother Don, operates a very efficient little shrimp freezing plant in Pedregal, about halfway between David and the Gulf of Chiriqui. Three days collecting otoliths from fish delivered to market by shrimpers provided examples of most all species exploited for sale (predominantly sciaenids and pargos). Much credit is due Don Croker for his pioneering efforts to expand the shrimp industry in Panama and other Latin American countries. My gratitude may be expressed manyfold for his help and hospitality.

From Panama, the operation moved to Costa Rica. In San Jose, contacts were made with the University (Dr. Bill Bussing and Pedro Lion), the FAO Mission (Bob Ellis), The Peace Corps (Carl Kalb and Bob Nishimoto) and the Seccion Pesca y Vida Silvestre (Sr. Milton Lopez). No fish were collected in San Jose though the public market contained representative species from the Pacific coast. Plans were made to collect aboard an FAO research vessel operating temporarily from the port of Puntarenas. One day of travelling and 2 days finally bore fruit and 2 days of trawling in the Gulf of Nicoya resulted. An otolith collection was obtained from fish which, because of their small size, do not find their way to market. Again, these were predominantly sciaenids, though several other families were represented.

In the air terminal at San Salvador, El Salvador, there was a chance-meeting with the Dick Crokers who were headed south. During our brief visit, while exchanging aircraft, Dick sent regards to all in California.

This trip was most interesting and educational; the otolith collection, while not exhaustive, is a start on the necessary comparative material. The knowledge and experience gained on this brief visit should ease the task of planning future trips to Central America.---W. L. Craig.

1. BOTTOMFISH

A. Fishery

Flatfish: Adverse weather was the primary limiting factor for the March trawl fishery. Periods of stormy weather kept the northern California fleet in port most of the month. Most fishing was in shallow to intermediate depths. Moderate catches of English and Dover sole along with light catches of petrale comprised the landings.

The Eureka trawler Flicker sank off Brookings, Oregon with a full load of Dover sole but, fortunately, without loss of life.

Roundfish: Landings were moderate. Lingcod, sablefish, channel rockfish, and canary rockfish were the major species at Eureka while sablefish, bocaccio, and chilipepper were dominant at other ports.

Monterey longline fishermen made good catches of sablefish along with blackgill rockfish from about 250 fathoms.

Monterey gillnet fishing for inshore rockfish faded because of diminished catches, gear damage, and conversion of vessels for salmon fishing.

B. Research

Flatfish: Market sampling was conducted at major ports. Age analyses of recent samples and summarization of 1967 samples were accomplished.

Dover sole age studies continued with emphasis on deriving an otolith length to total fish length relationship.

Length-weight data for juvenile English sole and speckled sanddab taken in 1966-1967 Humboldt Bay trawls were sent to Terminal Island for regression analyses by computer.

Trawling was conducted in Humboldt Bay to collect juvenile flatfish for Water Projects Branch for bioassay in relation to a Eureka pulp mill discharge problem.

Calculations of catch per effort of important species by drag for the 1964-1966 Fort Bragg area were made in cooperation with the Data Analysis Project.

Jackie Lundy, a research observer from Cubberly High School, Palo Alto, joined the project. Jackie will be engaged in a population study of English sole utilizing meristic, morphometric, and tagging data.

Roundfish: The final draft of "Review of Rockfish Research" by J. B. Phillips was sent to Sacramento for duplication and inclusion in the MRO Reference Series.

Project is on schedule.

2. SHELLFISH

A. Fishery

Abalone: The season opened March 16 with poor weather for commercial abalone fishermen at Morro Bay. A few hardy fishermen ventured forth but poor diving conditions restricted daily catches to five dozen or less per boat. However, with rapidly improving weather by March 18, daily boat catches improved. Of 15 fishermen interviewed, the red abalone catch ranged from almost five dozen to seventeen dozen, averaging about nine dozen per boat.

Unfavorable weather again set in toward the month's end at Morro Bay and fishing activity and daily catches declined.

Processed red abalone meats from the Point Estero-Cambria region are running about seven pounds to the dozen while meat yields from the Point Buchon-Point San Luis region are nearly eight pounds per dozen.

Fishermen are receiving $14 per dozen red abalone at Morro Bay, but this price cannot hold unless meat yields improve.

At least ten sea otters have moved two miles further south into the Point Estero-Cambria abalone beds. The otter herd is rafting offshore of the Cambria Air Force radar station located about four miles northerly from Point Estero. Fishermen have seemingly become resigned to the otters and their foraging habits and no abalone boats were noted working off the Cambria coastline in those areas where otters have been foraging since last year.

Crab: Fishing in the San Francisco area has ceased due to poor catches and the approach of the commercial salmon season. Landings received from pink tickets total 916,000 pounds. Landings are not expected to surpass 925,000 pounds for the season. This is over double last season's landings but only half of the predicted landings.

Crab fishermen from Fort Bragg to Crescent City, after a week of unfishable weather, demanded and received a new price of 25 cents per pound on March 19. Reported landings of 10.5 million pounds to date exceed last year's total (10.3 million pounds). If fishing trends follow those of previous years, landings for this season could well be a record high.

Approximately 50 boats are now fishing crabs out of Eureka, but there is much talk of bringing in gear with salmon season approaching.

Shrimp: Ocean shrimp season closed.

The one-boat trap fishery for the spot prawn, *Pandalus platyceros*, which commenced late in December, ended in mid-March, at which time the 27 wicker traps that had been fished in about 150 fathoms off Point Cypress were brought ashore. The boat (Jackie Boy) is being prepared for the opening of salmon season next month. One other boat (Catherine M.) set out 10 traps for prawn, in the same general area, but quit after about ten days because of poor returns.

Oysters: Planting certificates were issued for 10,355 cases of Pacific oyster seed which was discharged at Eureka and San Francisco on March 16 and 18 respectively. The seed was shipped from Shiogama, Japan and carried as deck cargo on the "Kochu Maru". Coast Oyster Company received the largest portion of the shipment for planting in Humboldt Bay. Remainder of the seed went to Tomales Bay, Drakes Estero, and Morro Bay. This was the largest shipment of seed from Japan since 1964 when 10,625 cases were imported. The seed had previously been inspected by Dan Gotshall during February at the packing sites in Japan.

Coast Oyster is still producing about 400 gallons per day from its Sand Island beds.

Eureka Oyster Farms now have employed three openers and are producing about 55 gallons of oysters per day from racks in North Bay. The jar pack is similar to that of Coast Oyster. This summer they plan to rechannel production of "Oystamins". They are still in the process of acquiring equipment necessary for large-scale operations.

B. Research

Abalone: Two tagged red abalone were recovered by commercial fishermen in the Morro Bay area. One specimen that was 181 mm long when tagged and had been at liberty 564 days grew 17 mm.

Survey dives were made at our Point Estero study site. In one 50-foot square plot in which all abalone and interrelated forms were removed in February 1966, abalone had essentially repopulated the area but very few sea urchins were present. Twenty-nine adult red abalone were located and removed in February 1966 and 24 adults had migrated into the plot by this month. However, of 203 red sea urchins that were removed in February 1967, only seven were counted in the plot this month. Three of these were large adults that had migrated into the plot while the remainder were sub-adults that may have emerged from deeper crevices within the plot.

An estimated ten percent of last season's bull kelp sporophytes remain in the Point Estero-Cambria region. New seasonal sporophytes are now starting to develop; the maximum plant length noted was about 10 cm.

Crab: Three crabs, tagged in August 1966, were returned by commercial fishermen. Growth ranged from 9 mm to 27 mm carapace width.

Some time was spent on analyzing trawl cruise data for growth and relative abundance of the 1967 year class. After looking at the catch data from these cruises, the present crab trawl gear appears inadequate. New equipment is being purchased for use on the next cruise.

The tag mortality study being conducted in Drakes Estero is not progressing satisfactorily. Unsuitable habitat and injuries in handling have caused excessive mortality. A change in habitat and less handling will be tried with a new group of crabs.

Seventeen fishermen interviewed in Eureka averaged 7.9 pounds per trap overnight.

Fort Bragg fishermen are averaging 6-8 pounds per trap, but gear is not being pulled daily. Most landings result from two and three day soaks.

Many soft crabs are still being landed in Eureka. An average of 18.3 percent of the 300 crabs examined at Eureka markets had soft shells. Average shoulder width was 173.2 mm, and average weight per crab was 1.80 pounds.

A 100 crab sample was examined at Fort Bragg. The crabs were small -- averaging 168 mm shoulder width and 1.69 pounds per crab -- but in very good condition. No soft shells were observed.

Monthly weight-length sampling continued.

Shrimp: At Eureka, some time was spent working up shrimp statistics for publication and use at Terminal Island for yield model computations.

At Menlo Park, length, weight and sex determinations were made for two spot prawn samples from Monterey.

Oysters: Pacific oyster seed from four half cases were placed in plastic mesh bags at Drakes Estero and the Port of Redwood City for hardening and to obtain maximum survival.

The loss of 223 scallops from the February 12, 1968, Japan shipment occurred recently at Tomales Bay. Mortality appeared to be caused by heavy freshwater runoff coupled with a series of low tides. However, approximately 100 scallops at a more saline location in Tomales Bay and another 160 at Drakes Estero from the same shipment were doing well at the last observation.

3. SHELLFISH AND BOTTOMFISH DATA ANALYSIS PROJECT (M68D)

We are happy to announce that Tim Farley, a former member of the Delta Study in Stockton, joined the project as an Associate Marine Biologist. Tim, who has experience in fisheries research and computer programming, is a welcome addition to the staff.

Information Storage and Retrieval System: Data Bank

Two sets of crab-cruise data have been established in the INFOL system: 57-N-6 Crab and 59-S-7 Crab. Both the shrimp and crab master files were updated. We now have all of the shellfish cruise data from 1950 to 1967 on two magnetic tapes. The data from cruises 68-N-1, 68-N-2 and 58-N-7 are being keypunched.

The flatfish data collected during the box-sampling survey were edited and coded and are being keypunched at Terminal Island. The data will be put into an INFOL system to produce distributions by season and depth.

Market sampling forms for bottomfish, crab and shrimp were produced. The INFOL system for market sampling was tested using 25 crab market samples. As a result, a few minor changes will be made to the program. The data will be sent to Terminal Island for keypunching.

Operations Research

The effort of the trawlers in the Fort Bragg area from 1964 to 1966 was extracted from the logs. An attempt is being made to assign weights of the trawl-caught species to individual drags using the Programma 101. We hope to refine the effort statistics for petrale sole and use them in conjunction with tagging data to estimate population sizes and mortality rates.

We are furthering our attempts to define effort expended by crab fishermen by using a mail survey. Letters and return postcards are being sent to each crab fisherman. The fishermen are being asked to tell us the number of traps they used each month. As part of the study, we will compute a regression of the number of traps as a function of the physical description of the boat. If there is a relation, it will help us assign effort to non-respondents. Concurrently, we will compare the efficiency of certified mail over first-class mail for realizing responses.

A length-weight curve is being computed for the spot prawn, *Pandalus platyceros*. Several curves will be generated by separating the data by sex and time periods.

Eureka and Crescent City fishing activities were observed. Discussions were held with Gotshall and Smith on the possibility of including certain crab and bottomfish data from Eureka in an INFOL system.

4. PESTICIDE MONITORING (B.C.F. Contract)

A water line to transport San Francisco Bay water to a temporary laboratory set up at the Fish and Game warehouse in Redwood City has been completed. Studies on the effects of DDT on the Dungeness crab will begin at this facility in March.

A permit to harvest shell stock Pacific oysters from Hedionda Lagoon has been given to Mr. Richard Northcraft by the California Department of Public Health. Approval to harvest commercially grown oysters in this estuary was granted after pesticide residue analysis revealed less than 1.5 ppm DDT, DDD, and DDE, the maximum tolerable level allowed by the U. S. Public Health Service.

Approval for enrollment in a course on Pesticides and Public Health presented by the National Communicable Disease Center Pesticides Program in Atlanta has been received from Gulf Breeze. This is a four day course; subjects will include toxicology, chemistry of pesticides, legal aspects of pesticide usage and pesticide monitoring problems.

A contract with the Bureau of Commercial Fisheries with proposals for Fish and Game financial participation to continue pesticide studies through June 1970 has been completed.

5. SHELLFISH LABORATORY OPERATIONS (Bartlett Project M64R3)

Floor plans were drawn to fit the proposed laboratory site at Pacific

Grove. These plans will be submitted to General Services and then to Stanford when a lease approval form has been completed by the Department.

Reprints on marine culture were reviewed and cataloged for use at the laboratory.

6. OYSTER DISEASE AND MORTALITY STUDY (B.C.F. Contract)

Routine sampling trips were made to all five study areas in March. Losses among the experimental populations of Pacific oysters were negligible.

Beginning next month, the sampling scheme will be altered to allow for more intensive study in areas where high mortalities have been noted (i.e. Humboldt and Tomales Bays). Since no appreciable mortalities were noted among the Pacific oyster populations in Morro Bay and Elkhorn Slough during the past year, it is anticipated that these areas will be visited no more often than once every two months. Drakes Estero will be monitored monthly in conjunction with Tomales Bay. Sampling will be intensified at Tomales and Humboldt Bays during the mortality period (May through October). It is anticipated that the stations will be visited weekly at Tomales Bay and tri-weekly at Humboldt Bay. One man will be permanently stationed at Eureka because of the intensified work load there.

The processing of all tissue and plankton samples continues.

The program is on schedule.

7. PORT SAMPLING (Bartlett Project 66-D)

Crab fishing was slow the past month at Crescent City, Brookings and Port Orford. Southerly storms kept most boats in for about ten days during the month. The fishermen are pulling their traps only every two to three days. Some Crescent City and Brookings fishermen are starting to bring in crab traps and get ready for salmon fishing.

The price of crabs went up from 18 cents to 22 cents per pound on March 16 and two days later the fishermen went on a one day strike for 25 cents per pound which is now the going price at all three ports.

Twenty-nine catch-per-unit-of-effort interviews at the three ports gave 8.7, 5.2 and 3.8 pounds per trap for overnight fishing at Crescent City, Brookings, and Port Orford, respectively.

Six hundred crabs were measured, weighed and examined for shell condition. The average shoulder widths for crabs at Crescent City, Brookings and Port Orford were 169.2, 168.5, and 169.2. The average weights were 1.75, 1.69, and 1.70 for Crescent City, Brookings, and Port Orford. The percentage of soft crabs in samples ranged from 2.0 and 2.7 at Brookings and Crescent City to 13.5 at Port Orford.

Sixteen sport crabbers using ring nets in Crescent City Harbor and

South Beach averaged 3.7 crabs per fisherman hour. One fisherman using two 28-inch traps and fishing them overnight caught nine crabs one day and eight the next day. About 15 percent of the sport crabs measured were less than legal size.

The Oregon shrimp season opened March 1, but no fishermen plan to fish for shrimp at Brookings or Port Orford until mid-April.

Sport fishermen fishing for perch from Crescent City dock have caught several sublegal silver salmon about 12 to 18 inches in length during the past month.

8. SAN FRANCISCO - DRAINAGE OCEANOGRAPHY (S.W.Q.C.B. Contract)

Analysis of benthic material from the first cruise has been completed and is ready for compilation.

Because of unforeseen difficulties, analysis of benthic material from Cruise II will not be complete in the May 1 interim report.

Beneficial use, biological and benthic data are being summarized by area. The areas have been delineated as follows: Fort Ross to Point Reyes; Point Reyes to Pillar Point; Pillar Point to Sand Hill Bluff; and Sand Hill Bluff to Point Lobos.

9. PELAGIC FISH

A. Fishery

Landings in tons	March		January 1 - March 31		
Species	1968*	1967	1968*	1967	10 yr. mean 1957-1966
Anchovy	50	6,007	750	24,400	2,544
Mackerel, jack	450	2,131	3,821	4,565	7,857
Mackerel, Pacific	13	17	122	108	2,530
Sardines	2	5	19	31	817
Squid	400	957	1,550	2,572	1,581
Total	915	9,117	6,262	31,676	15,329

*Estimated. Accumulated landings are revised monthly.

B. Anchovy

Fishery: During March there was no fishing activity in the Monterey Bay area. In southern California three fishermen and two airplane pilots exerted considerable effort scouting for anchovies. Two of the fishermen made sets on anchovies that were undersize and had to be released. Other schools were either small or too deep for purse seining.

Live-Bait: Bait dealers from San Diego to Santa Barbara reported large numbers of anchovies. However, fish were exceptionally difficult to catch. Many dealers hauled their bait from San Pedro-Long Beach Harbor where fish were not as wild as those elsewhere.

C. Sardine-Mackerel

Fishery: Rough sea conditions, combined with a lack of fish, resulted in a decline in the effort expended by the fleet. As a result the jack mackerel catch dropped to only 450 tons. No fish were taken north of Point Conception.

Approximately two weeks of fishing time was lost due to sea conditions; this was partially offset by the removal of the "light of the moon" restriction that requires the fleet to remain in port two day before and after full moon. Only 50 tons of jack mackerel were landed during the "light of the moon" period as most of the fleet tied up after two nights of poor fishing.

Most of the jack mackerel landed in the San Pedro area was taken at Tanner and Cortes Banks, with lesser amounts taken around San Clemente and Catalina Islands. Ninety-four tons of jack mackerel were landed at Port Hueneme this month; the majority came from Tanner and Cortes Banks.

Two separate nights of fishing at Santa Barbara Island produced 11 of the 13 tons of Pacific mackerel landed during the month. One 7 ton school of Pacific mackerel was taken on the night of the 20th, while on the night of the 24th a mixed 8-ton school consisting of 50% Pacific and 50% jack mackerel, was caught. All of the Pacific mackerel were delivered to the fresh fish markets.

Only two tons of sardines were taken to the fresh fish markets this month. There were no sardines landed at the Terminal Island canneries.

Research: Routine sampling and interviewing of the fleet continued. Only one jack mackerel sample was taken, while no sardine or Pacific mackerel samples were collected.

Because of the current interest concerning the status of the Pacific mackerel population, a comprehensive paper, "The Pacific Mackerel Fishery: A Summary of Biological Knowledge and the Current Status of the Resource," was prepared and presented to the Marine Research Committee. Work continued on the jack mackerel age composition article and a paper describing the 1965-66 sardine age and length composition was near completion.

One hundred tags, 50 dart and 50 spaghetti, were prepared and given to the crew of the ALASKA for possible bonito tagging during the current cruise off Baja California. Two attempts were made to tag bonito locally; neither was successful.

D. Fisheries Resources Sea Survey (M63R)

The R/V ALASKA returned from a survey of central California waters March 8. Anchovies were found over almost the entire region. They were distributed within 15 miles of shore in small scattered schools except near Point Arguello where several commercial size schools were detected.

Based on echo sounding transects, an estimated 150,000 schools were present over the survey area. A similar survey last October found

143,000 with a higher proportion of large dense schools.

Evidence of heavy spawning was shown by unusually heavy catches of larval, post larval, and juvenile anchovies. This is the second consecutive year central California waters have shown good signs of anchovy spawning. This region may be a more important spawning grounds than indicated by egg and larva surveys in past years.

The ALASKA departed March 19 for a survey of Baja California waters. This survey should produce a good assessment of the anchovy population as it is being conducted when anchovies are most vulnerable to echo-sounder surveys. A U.S. Bureau of Commercial Fisheries scientist is aboard to collect material for an anchovy subpopulation study.

Estimates of the number of anchovy schools occurring in each 20 minute latitude-longitude grid were made for all echo sounding-transect cruises since 1966. These were then summed for each cruise to give a total number of schools occurring in the area covered per cruise.

Plans for installing a sonar aboard the ALASKA in early April were upset due to a longshoremen's strike in New York City which has delayed delivery of the equipment.

E. Data Analysis

The card-to-tape program for past Sea Survey data was "debugged," and is now working. Data from 1950 through 1953 have already been processed. The remaining data (1954 to present) are being added at a rate of one year daily.

Although the program was written for use only on the Univac 1107 computer, the data tapes can be utilized on either the 1107 or the new 1108 computer.

10. TUNA

A. Albacore

Research
Life History: Age and growth--A computer program to stratify historical albacore catch data into length classes was completed. The 1967 age composition data are ready for keypunching.

Population Dynamics: The layout for a new albacore logbook was completed and sent to the printer for a cost estimate.

Fishery
No action.

B. Bluefin Tuna

Research
Life History: Age and growth--The bluefin tuna scale samples collected during the 1967 season have been read. The information has been submitted to Biostatistics for keypunching. Age-length-frequency listings

and weight-length tables will be compiled.

Fishery
No action.

C. Bonito

Research
Life History: Age and growth--A special length-weight-otolith sample was taken.

Fishery
Both the sport and commercial fishery were slow this month.

D. Miscellaneous

Personnel
John Geibel was appointed TAU Assistant Marine Biologist on March 22.

Jim Phelan spent most of the month on jury duty.

Bill Craig returned from a trip to Central America from March 5-24 (see report elsewhere).

11. SPORTFISH

A. Partyboat

Research: Fourteen sand bass were tagged, 5 recovered. None of the 5 recoveries all tagged December 10, 1967, at Newport, had moved out of the harbor. Growth ranged from 4 to 7 mm in the 3-month period.

Fishery: Field trips from Seal Beach, Balboa, San Clemente and Newport Beach indicate that surface fishing for bonito, kelp bass, and barracuda could erupt at anytime, presumably under the stimulus of warm water. Meanwhile, much partyboat effort is spent on California halibut, although the catch per angler is generally low. Halibut require more angling finesse than do the surface species, and this may account for some of the poor yield.

The 1968 partyboat catch, accumulated through February, compares with 1967 as follows:

Through February	1968	1967
Rockfish	361,660	352,233
Bonito	50,366	9,737
Kelp, sand bass	23,787	22,395
Barracuda	19,198	19,417
Salmon	6,393	4,016
Calif. halibut	6,155	4,635
Striped bass	399	507
Yellowtail	221	462

B. Environmental and Behavioral Studies of Coastal Sport Fishes (DJ F22R)

Field work was completed on our reimbursable contract study of Upper Newport Bay.

Project personnel made a test run with North American Rockwell's "swimmer sled" in the waters offshore from Santa Catalina Island. This "sled" will eventually make an excellent tool for use in our marine ecological survey work and for use by Marine Patrol when reconnoitering extensive areas underwater, but its present capabilities leave much to be desired. Difficulties encountered in ballasting and maneuvering the sled were discussed with company representatives who informed us that these items will be corrected before the "sled" is available for purchase.

Manuscript preparation accounted for many hours of time during this month.

We attempted an intensive collection of fishes at the Hermosa Beach artificial reef, at the 60-foot depth, and despite adverse currents and surge, we captured representatives of 12 of the 18 species observed. We were assisted in our endeavors by Region 5, Wildlife Protection and MRO-TI personnel. Of particular interest was our collecting three red brotulas (*Brosmophycis marginata)*, a seldom observed reef dweller. Typically brotulids are retiring creatures which frequent deep crevices and caves. Our prior red brotula records from this reef include one collected in a small-scale poisoning, November 1963, and another observed hiding beneath more than a foot of rock rubble, July 1964.

Redondo Harbor Biological Monitoring-(Southern California Edison Company Contract)

Most of the month was spent in the field conducting the creel census. Three days were spent on a combined benthic index (diving), and bottom trawl survey of the harbor. Overnight gill net sets were made also at two locations within the harbor. One of these sets captured two Pacific roundherring (*Etrumeus teres)* in addition to the more typical and expected species, such as embiotocid perch and bonito.

Office time was devoted to tabulating creel census data and preliminary sorting of material obtained in our benthic and trawl surveys.

C. Central California Marine Sportfish Survey (DJ F25R-1)

Sportfish and gill net boat sampling continued at Monterey.

Experiments with quinaldine by scuba divers continued with some success in capturing copper rockfish, young blue rockfish, and lingcod.

Experiments in removing stomach contents from live fish using thin metal tubing and water flow were successful on most fish from the kelp bed except the surfperches. Further experiments are being conducted on this group of fish.

One week was spent on the kelp bed ecology study. Permanent anchoring buoys were placed in the kelp bed study area to facilitate collection of data.

About 120 fish were tagged this month. Three tags were returned by sportfishermen.

Miller attended a meeting of the Monterey Council of Sport Clubs with Orcutt on March 4. Gill netting and partyboat catch information was given.

Miller presented a slide talk on identification of marine fishes to 29 members and friends of the Santa Cruz Aqua Tech Skindiving Club.

12. FOOD HABITS STUDY (Bartlett M67R)

Phase I activities centered on adding to our otolith reference collection: collecting, measuring, labeling, filing, etc. Otoliths were examined and processed from hake, jack mackerel, sand bass, spotted bass, white seabass, skipjack, bluefin tuna, black perch, blacksmith, red brotula, and spotted cusk-eels.

Phase II tasks included collection of fish in the field and analysis of stomachs in the laboratory. Commercial purse seine activities yielded one bonito sample for stomach analysis. Trawling, gill netting, and selective chemical treatment of an artificial reef (Hermosa) by another investigation yielded 11 additional samples comprising a wide variety of species.

Stomachs from fish collected off Belmont Shore in February were analyzed.

13. SPECIAL PROJECTS

A. Southern California

The annual census of elephant seals on San Miguel Island planned for the third week of March had to be postponed because of boat engine trouble.

Two days of red tide research were accomplished.

Some time was spent on the thermal study.

Project is on schedule.

B. Northern California

Seaweed with herring spawn attached was harvested at Tiburon, San Francisco Bay on February 23. Aplin made observations on this operation where six men collected 1,200 pounds of seaweed in about four hours. An additional 500 pounds were gathered the following day. Wholesale price is about one dollar per pound and the retail price in Tokyo where it is to be consumed is ten dollars a pound.

14. BIOSTATISTICS

A. Data Processing

Regular Reports: February 1968 cannery and processor reports were

completed, and the monthly letter summarizing the tuna case pack was mailed.

The December 1967 statistical reports of landings and shipments were tabulated, decoded, and distributed to the field offices.

The January 1968 trawler check reports were tabulated.

The December partyboat catch reports were tabulated, and letters summarizing the data were mailed.

The March list of unregistered boats landing fish during the current license season was prepared for Wildlife Protection Branch. This is the final list for the 1967-68 season.

The license unit processed the February master list changes for Accounting.

Annual Reports: The 1967 annual processors reports were tabulated and decoded in preparation for the circular.

Tables of the 1967 case pack and tables dealing with processed commercial and sport fish have been compiled for the circular.

The 1967 listings of registered boats were tabulated, decoded, and sent to the field offices.

The 1966 bluefin catch-effort reports I and II and two special bluefin log reports were tabulated and decoded for Tuna Investigation.

Special Reports: The following IBM card decks were prepared for the Shellfish and Bottomfish Data Project, Menlo Park:

Crab cruises	58-S-7
	68-N-1
	68-N-2
Box sampling	2200-2249

Xerox copies of the 1967 crab boat registrations were made and sent to the Shellfish and Bottomfish Data Project, Menlo Park.

Five year averages of landings by selected block origins were punched, tabulated, decoded, and sent to Mel Odemar, San Francisco Drainage-Oceanography Project.

An IBM card deck of 1967 creel census data was prepared for the Cold Water Reservoir Project.

A count of boats landing squid in 1965 was prepared for the Pelagic Fish Investigation.

Work in Progress: The 1967 annual partyboat reports are being tabulated.

The editing of the January 1968 market fish receipts is finished except for some anchovy receipts.

The editing of the February 1968 market fish receipts and the March

1968 cannery receipts is in process.

We are receiving 1968-69 boat registrations and fisherman's licenses. The new license year begins on April 1.

B. Technical Assistance and Biometrical Analysis

Statistical and Mathematical Analysis: Work on a paper discussing population dynamics of Pacific mackerel continued. However, the computational portions will have to be recomputed because discrepancies were discovered in the catch data used in the original work.

The albacore fishing power study is being resumed after a long interruption. A newly published estimating procedure by D. S. Robson may be superior to the methods we have previously used and an evaluation is in progress.

Computers: Weight-length analyses were run on flatfish from the 1966-67 Humboldt Bay trawls and on 1967 bluefin catch samples, using the new PL/1 program on the 360 computer.

A report of abalone landings by origin block by month was produced from the 1967 commercial tape on the CDC 3600 computer.

Debugging continued on a program testing whether data written by a PL/1 program could be read by a FORTRAN program.

There has been no progress in debugging the PL/1 commercial card-to-tape program because of a series of computer systems errors which IBM analysts have been unable to solve. Until the problems are cleared up and efficiency comparisons are made between the PL/1 and FORTRAN programs, we cannot begin new projects nor consider rewriting existing FORTRAN programs in PL/1.

Investigation of the feasibility of producing summary tapes by place of first landing and by origin block from the commercial catch tape has begun.

15. BIOLOGICAL NOTES

Two Greenland halibut, *Reinhardtius hippoglossoides*, were received; the first specimens since July 1966. The fish, a male and a female, were taken aboard the trawler, "Admiral King", west of Eureka in 200 fathoms.

An 18.5 pound skipjack was caught in the surf near Belmont Shore pier on March 22. This is an unusual catch.

16. MISCELLANEOUS

A. Meetings, Talks and Visitors

March 1 - Smith met with the Ocean Resources Research group to discuss Sea Grant College proposals at Humboldt State College.

March 1 - Blunt met with Charles Carry, Tuna Research Foundation, to discuss the mackerel fishery.

March 2 - Aplin attended the launching at Oxnard of the "Golden Dolphin", collector boat of Marine World, Redwood City.

March 3 - Sea Grant College requirements were discussed at meeting between Dr. John DeWitt, Humboldt State College, Dr. Ellsworth Briggs, College of the Redwoods, Tom Neil, Humboldt Seafoods, and Smith.

March 4 - Northcoast marine resource and education potentials were discussed with Al Owens, AID consultant, administrators and staff of Humboldt State College - Smith.

March 4 - Gary Monroe, Region I, and Smith spoke on the Department of Fish and Game organization and their respective Branch functions to a conservation class at College of the Redwoods.

March 4 - Smith met with the Commercial Fisheries subcommittee, Overall Economic Development Plan for Humboldt County.

March 4 - Turner spoke on California Department of Fish and Game Reef Studies, to the Conchological Club of southern California; Los Angeles.

March 4 - Roedel attended the assembly sub-committee budget hearing in Sacramento. The MRO budget was approved as submitted; the MRC budget was held over.

March 4 - Roedel attended a department meeting concerned with the sea otter problem, Sacramento.

March 4 - Gotshall, Smith and Boydstun attended the Ocean Resources Research Group meeting to discuss feasible projects for Humboldt State College's application for Sea Grant College designation.

March 4 - Orcutt and Miller met with the Monterey Sportsmens Council at Gonzales to discuss gill net and sportfishing in Monterey.

March 6 - Meeting with Carol Edwards, Immaculate Heart College, to discuss her school biology project: Turner, Strachan; Terminal Island.

March 6 - Gotshall, Smith, Taylor, and Boydstun met with other local conservationists to participate in the formation of a Humboldt Bay Ecological Society.

March 6-8 - Tomlinson attended the Inland Fisheries Branch meeting, Santa Rosa.

March 7 - Roedel and Kaneen attended a meeting of the U.S. section of the IATTC, San Diego.

March 8 - Gotshall and Smith met with members of the Ocean Resources Research Group to edit the Sea Grant College program application for Humboldt State College.

March 10 - Aplin gave a talk on "Living Resources of the Sea" to the oceanography class of the USNR officers school at San Mateo.

March 11 - "The Present Status and Future Potential of Northcoast Marine Resources" was the topic of a speech presented to the Del Norte County Chamber of Commerce by Smith.

March 11 - Strachan attended a panel discussion on the upper Newport Bay tidelands exchange: Corona del Mar High School.

March 12 - Roedel and Baxter participated in a CalCOFI meeting at La Jolla.

March 12 - Abramson attended a meeting of the Statistical Program Evaluation Committee, RAND Corp., Santa Monica.

March12-13 - Meeting with Robert R. Given and Dennis Lees to evaluate North American Rockwell's "swimmer sled" and to discuss invertebrate identification and natural and man-made reef ecology: Ebert, Turner, Strachan; U.S.C. marine laboratory, Santa Catalina Island.

March 13 - Roedel, Baxter, Blunt, Parrish and Richardson attended the MRC meeting at the Fishery-Oceanography Center, La Jolla.

March 13 - Tomlinson and Abramson participated in a meeting on proposed future striped bass research, La Jolla.

March 13 - Orcutt with Bissell met with E. Smith of Pacific Marine Station to discuss public use of marine shoreline in central California.

March 13 - Carlisle gave a talk on grunion to the Southern California Rod and Gun Club, Los Angeles.

March 14 - A few old marine resources friends honored Julie Phillips at a dinner in Monterey.

March 15 - Smith met with Drs. Richard Ridenhour and Roger Barnhardt to assist in the selection of a recipient for this years Pacific Fishery Biologist Scholarship award.

March 15 - Turner participated in the first meeting of the State Department of Parks and Recreation's Advisory Board on Underwater Parks; Sacramento.

March 16 - Carlisle was interviewed on grunion on KNX radio.

March 18 - Ebert met with Ted Tutschulte, a graduate student at Scripps Institution of Oceanography, to discuss abalone behavior.

March 18 - Orcutt and Katkansky participated in the mortality discussions and steering committee meetings on Shellfish Pathology at Portland.

March 19 - Orcutt attended the Research Staff Meeting of PMFC in Portland.

March 19 - Carlisle met with Wood and Ridgway to discuss use of radioactive materials in Mugu Lagoon, Pt. Mugu.

March 20 - Mais conferred with Frank Hester and Paul Smith, BCF, on sonar at the Fishery-Oceanography Center, La Jolla.

March 20-21 - Roedel attended the regular monthly meetings in Sacramento and the Senate subcommittee budget hearing. All items were taken under advisement, following the usual procedure of this subcommittee.

March 21 - Meeting with Richard Bueermann and Don Mitchell, Regional Water Quality Control Board #8, to discuss ecologic surveys: Turner, Strachan; Terminal Island.

March 22 - Meeting with J. Onellion and D. Ozab, Underwater Mining and Environmental Systems, to discuss aqua-culture and subtidal marine ecology: Turner; Terminal Island.

March 24-27 - Smith attended a conference on the future of the U.S. fishing industry in Seattle.

March 25 - Roedel and Kaneen attended a meeting with industry called by BCF to formulate positions for the forthcoming IATTC meeting, Terminal Island.

March 26 - Dr. Alan Longhurst and Dr. Frank Hester met with Roedel at CSFL to discuss research projects of common concern.

March 27 - Roedel attended meetings in Sacramento concerned with Pacific mackerel and with funding of ocean work.

March 27-28 - Katkansky, Burge, Modin, Warner and Farley attended MRO Orientation Training at Terminal Island.

March 28 - Tomlinson attended a meeting on the Lake Destratification Project, San Diego.

March 28 - Meeting with Dorothy Gasser, Immaculate Heart College, to discuss marine pollution problems: Turner; Terminal Island.

B. Personnel

March 1 - Jeanne P. Cowger appointed permanent Supervising Clerk I, Biostatistics, Terminal Island.

March 1 - Michael A. Lonich appointed Deckhand, Fish and Game Boat, Terminal Island.

March 1 - Timothy C. Farley appointed Associate Marine Biologist, Shellfish and Bottomfish Data, Menlo Park.

March 15 - William D. Ettinger, Tabulating Machine Operator, Biostatistics, Terminal Island, resigned.

March 22 - John J. Geibel promoted to TAU Assistant Marine Biologist, Tuna Investigations, Terminal Island.

March 27 - Kathleen D. Plumb appointed permanent Key Punch Operator, Shellfish and Bottomfish Data, Terminal Island.

W. D. Leighton
Acting Manager

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